TRANSACTIONS OF SOCIETIES.

ART. XIX.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1870. *May* 18. *Trephining in Cerebral Disease, with a Successful Case.*—Dr. WILLIAM PEPPER remarked that it is familiarly known that the operation of trephining has been frequently performed for the relief of epilepsy. In some of these cases the practice has been purely empirical, and has been followed by no improvement in the condition of the patient. In other instances there have been more or less clear indications for the operation, and its performance has at times been followed by most brilliant success.

Among the latter may be mentioned those cases in which epileptiform convulsions have followed a depressed fracture of the skull. So, too, there are cases where a fixed and circumscribed pain, or, still more, some lesion of the external table of the skull, as an osteophyte or a spot of necrosis, has indicated the probable seat of the intracranial disease. In such instances it has occasionally happened (as in the one operated on by Mr. Cline, the specimen from which is preserved in the museum of St. Thomas's Hospital, London) that an osteophyte has been found springing from the under surface of the circle of bone removed by the trephine. In constitutional syphilis, also, it not rarely happens that grave cerebral symptoms make their appearance. In some such cases there is no external sign whatever to aid in locating the seat of disease, whether it be a periostitis, an ostitis, or a gummy tumour springing from the membranes. Even here, however, a careful analysis of the symptoms and the mode of their development will go far to determine both the nature and seat of lesion. In other cases this diagnosis is rendered more easy by the detection of some localized disease of the pericranium or cranial bones, which may be concluded to correspond with the seat of intracranial disease.

In the following case of cerebral syphilis, where the symptoms were of the most alarming character, the conjunction of rational and physical signs pointed so clearly to a localized lesion as to lead to the performance of trephining with the happiest result.

Case of Constitutional Syphilis; Febrile Symptoms like Tertian Ague; Intense Headache; Left Hemiplegia; Strabismus and Ptosis; Increasing Coma and Stertor; Node on right side of Frontal Bone; Failure of Specific Treatment; Trephining; Recovery.—A. H. W., æt. 21, single, of temperate habits, entered the U. S. army in 1860. He had previously enjoyed good health, with the exception of an attack of gonorrhœa. In 1861 he had a chancre, followed by a suppurating bubo. He received wounds in left arm and foot, causing partial anchylosis of elbow and ankle. In 1865 he had rheumatic inflammation of knees and shoulders, and this persisted with varying severity for two years. In 1866, ulceration of hard palate; had also copper-coloured blotches on skin, nodes, and osteocopic pains. Was admitted to venereal ward of Philadelphia Hospital Feb. 19, 1868, with chancre and non-suppurating bubo. Had return of osteocopic pains, and later, about May 1, 1868, was attacked with periodic febrile symptoms resembling tertian ague, with intense frontal headache. Was transferred to medical ward under my care, May 5. Under full doses of sulphate of cinchonia the chills ceased, but intense frontal headache continued. The pain was in temples and forehead, occasionally in back of head, and was equally severe on both sides. There was also noticed a small node on frontal bone, to the right of the median line, $1\frac{1}{2}''$ above superciliary ridge. Under the idea of malarial origin of headache, the cinchonia was continued, and he was ordered arsenic and belladonna, with blisters to temples, which afforded only temporary relief. On May 23 there was slight paralysis of the left arm noticed, and a little drawing of the face to the right. There was no paralysis of the muscles of the eyes. Right pupil slightly larger than left—both movable. Other special senses not affected. Mind dull, and answers questions slowly but correctly, and no convulsive movements. He was immediately ordered iodide of potassium gr. v, and bichloride of mercury gr. $\frac{1}{16}$, thrice daily. The paralysis increased rapidly, becoming complete, with implication of the sphincters, by June 2. Electro-muscular contractility and sensibility seemed impaired on both sides, though more so on left side. Speech much affected, without any true aphasia. On June 6 paralysis remained the same; spasmodic twitching of palsied leg; high fever; pulse 108 to 112, with occasional profuse sweats; mind was dull. The doses of potassium and mercury were increased.

On June 11 heat of skin and acceleration of pulse continued. Slight internal strabismus of right eye noticed, with slight ptosis. On June 12 there was so marked a tendency to stupor that it was impossible to arouse him completely. Respirations were twenty in minute, stertorous—both cheeks puffing. Evident impairment of power on right side. Pulse 120, and feeble. Speech very imperfect, but dulness of mind too great to enable it to be said any aphasia was present.

On June 14, his condition remaining the same, a consultation was held with Drs. Maury and Rhoads, and it was determined to remove by the trephine a disk of bone from the portion of the os frontis corresponding to the node. The operation was very successfully performed by Dr. Maury. It was followed in about five hours by a slight convulsion.

The disk of bone removed presented a high degree of hyperostosis with sclerosis. The under surface was marked by irregular ridges and enlarged vascular pores, indicating a process of chronic inflammation of the dura mater. It was evident, however, that the diseased condition of the bone was by no means limited to this part.

In course of next forty-eight hours his condition decidedly improved. The respirations fell to 14, and became less stertorous. The pulse fell to 106, and became more regular and of better volume than for two weeks previously. Strabismus disappeared, articulation improved, and he expressed himself as feeling brighter and better. Treatment was continued (potass. iod. gr. x; hydrarg. bichlor. gr. $\frac{1}{8}$ t.d.).

From this time his improvement steadily continued, his mind grew more clear, and, by June 25, all traces of dulness had disappeared The febrile symptoms also subsided. Strabismus and ptosis disappeared, and speech rapidly improved. The power of motion returned more slowly in arm and leg, but in ten days' time from operation he was able to lift his leg clear of the bed. The dura mater bulged quite markedly into the opening made by the trephine. A small amount of healthy discharge occurred each day from the bone and soft parts.

In the course of two months he became able to walk with the aid of a crutch. He gained flesh and strength; his functions were all well performed; has had no return of headache or paralysis; wound still discharging; the cicatrization is advancing. Iodide of potassium (gr. x four times daily) has been continued; the mercury being suspended. In December the cicatrix on forehead opened, and it was found that some necrosis of the rim of bone surrounding the opening had occurred.

By March, 1869, all traces of paralysis of the face had disappeared, and he was able to walk quite well with the aid of a cane, though still obliged to swing left leg somewhat. The power of motion in left arm had not been so much recovered. There was marked impairment of motion of forearm muscles, with tendency to contraction of the flexors. The real improvement in power was much masked by the difficulty of motion in left arm and leg resulting from gunshot wounds. Still continued to take iodide of potassium, with occasional intermission of a few weeks, during which he always felt worse, and begged for a resumption of the remedy.

On June 24, 1869, an almost complete ring of necrosed bone was removed from around the point of trephining, and on August 25 another small piece came away, after which the wound assumed a healthy appearance, and healed by granulation.

He gained flesh rapidly, and when he left the hospital, early in 1870, presented the appearance of vigorous health. He had regained good power over muscles of shoulder and arm, but those of forearm were still rigid and contracted, holding hand placed at right angle on forearm. He had quite good use of leg, and walked without swinging, merely advancing it in a hesitating way. There were no evidences of any return of cerebral symptoms. The use of iodide of potassium was, however, maintained, with occasional intermissions.

At the time when these cases, upon which this brief paper is based, occurred, I was not aware of any recorded cases in which trephining had been performed for the relief of cerebral symptoms due to syphilitic disease of the brain or of the bones of the skull. Since then, however, I have met with several such cases, to which I will allude in the order of their occurrence:—

In the 1st volume of the *Dublin Hospital Reports*, p. 342, a case is reported, by Sir Philip Crampton, of a woman, æt. 32, who was admitted into Meath Hospital on December 14, 1812, with a tumour about the size of a half walnut over the middle of the left parietal bone; soft and elastic at the centre, and with a small fistulous opening leading down to the bone, which was bare and necrosed. This was attributed to a blow. The right arm was palsied and atrophied; the speech indistinct; and there was marked emaciation and pallor. There were also frequently recurring epileptiform fits. An incision was made through the tumour and the skull trephined beneath it. The dura mater bled freely, and was highly vascular. The patient steadily improved, and in six weeks was able to return to her occupation, having entirely recovered use of her right arm.

It is not improbable that the nature of the disease in this case was syphilitic.

In the *Medical Times and Gazette*, August 18, 1860, Mr. Jno. T. Bryant reports the case of a patient admitted to Guy's Hospital, February 14, 1860. He denied ever having had a blow or having contracted syphilis. For months previously a painful swelling had appeared over the left parietal bone; this suppurated and was opened. In February epileptiform convulsions (without loss of consciousness, and affecting chiefly left side of face and right side of body and right hemiplegia) appeared. Death appearing imminent, trephining was performed on February 17, over seat of disease on left parietal bone. On inner surface of circle of bone removed was a nipple-shaped osteophyte. The dura mater was inflamed and granulating. The fits ceased after the operation; the man, on regaining consciousness, expressed himself as well. All pain in the head had ceased, and the paralysis gradually disappeared. The opening made in skull gradually filled in; the bone, however, was still inflamed and roughened, and necrosed.

On February 24 slight fits occurred; and on April 24 they became reestablished, and recurred at short intervals till June 24, when he died hemiplegic, with pyæmic symptoms. There was extensive disease of parietal bone. The dura mater was adherent and softened, and pus was found both below and above it. Syphilitic deposits were also found in the testes, liver, and spleen.

In the report of the *Transactions of the Royal Medical and Chirurgical Society*, on June 26, 1860, published in *Medical Times and Gazette*, August 25, of same year, there is an abstract of a paper read by Mr. Henry Lee, upon this subject. This paper was not published in extenso in the Transactions of the Society, so that the abstract is my sole authority. In this paper Mr. Lee recounts the history of three cases of syphilitic disease of the bones of the skull, accompanied with marked cerebral symptoms, in which trephining was performed with marked relief in two of the cases. In the first case there was syphilitic necrosis of the left side of frontal bone, and of part of left parietal bone. The patient presented marked general debility, loss of sensation on right side of the face, and deafness in both ears.

The operation of trephining was followed by general restoration of health, recovery of sensation of the face (with exception of a small portion of the right side of the upper lip, which still remained numb), and perfect hearing. The inner surface of the portion of bone removed presented a very uneven surface, from whence numerous small, irregular spicula of bone projected.

In the second case there was extensive disease of the outer and middle tables of the skull. In consequence the patient became affected with severe convulsions, without loss of consciousness. The application of the trephine in this case was made over the right temporal bone. The portion of the internal table removed was slightly roughened, but not nearly so much as in the preceding cases. The fits recurred a few days after the application of the trephine, but ultimately ceased, and the patient was restored to comparative health.

In the third case there was extensive destruction of bones of skull, and in one place the inner table had perished while the outer and middle tables still maintained their vitality. At this point effusion of plastic matter had taken place, and the disease had spread by continuity of action to the brain, and produced red softening. There was no disease, either in the brain or its membranes, in those situations where the entire thickness of the skull had been removed. The patient was comatose at time of operation. The trephine was applied to the right parietal bone, but did not hit the exact spot where internal table was destroyed. The softening of brain having already occurred, the coma persisted, and patient died.

Still another case has been more recently published in Germany. The following is condensed from a more full account of the case :—

Syphilitic Necrosis of an extensive part of the Frontal Bone, Right Hemiplegia, and Consecutive Aphasia; Threatened Fatal Termination; Trephining with Favourable Results.—By J. A. VÈDRENES (*Rec. et Mêm de Méd, etc., Milit.*, 3 sér. xx. p. 42, January, 1868), in *Schmidt's Jahrb.* Bd. 144, 1869, p. 162.

The patient was a soldier, aged 29, of strong constitution. He contracted a hard chancre, which was followed by bubo, and in six weeks by roseola, alopecia, and enlargement of glands of neck. Soon after, numerous tubercles appeared on forehead and extremities. By end of second month, an abscess had formed over upper part of forehead, communicating with necrosed bone. Throughout third month, the patient suffered with intermittent febrile attacks, and lost flesh and strength. He was treated with quinia, iodide of mercury, and iodide of potassium. Some improvement of general health followed, the necrosis of frontal bone slowly progressed. By tenth month, his general health was much improved, and a small sequestrum from outer table of frontal bone was removed. By end of the year, the fistulous tracks on forehead were cured; but soon after swelling of gland and tubercles reappeared, with intense headache, loss of sleep and appetite. Neither iodide of mercury nor iodide of potassium had any influence upon the symptoms, and in a few days aphasia and impairment of sensibility on right side of body appeared. Three days later, delirium and general muscular spasms occurred. The patient's condition grew worse; the eyes were turned inwards, the limbs were relaxed, or at times tremulous; the breathing was frequent and jerking, the pulse 135 to 140 in a minute. As a last resort a crucial incision was made over necrosed portion of bone, and the crown of a trephine 1½ centimetre in diameter applied. The cutter was applied in middle line of left half of frontal bone, 9 centimetres above the corresponding eyebrow. Immediately after removal of the piece of bone, he opened his eyes, looked about with an astonished expression, yawned, moved his head in answer to questions, and said "yes." By examination with the finger, the inner table of skull was found intact.

A few drops of thick, bloody fluid escaped from the wound. The pulse fell to 84 in minute. The patient's condition improved much during the next three days; he became more intelligent, motion on palsied side increased, pulse sank to 80. On fifth day he could say some short words, had more power of motion, and pulse was 72. The firmness of frontal bone was destroyed, and it could be depressed, and a little pus came from under the sequestrum. The seventh day after the operation, several pieces of bone were removed. Subsequently other sequestra were removed; the patient improved daily, soon became able to say several words, and recovered power of motion. On twenty-first day he was able to sit up, and speak much better; the wound had, to a great extent, healed, though several splinters of bone remained to separate. On twenty-seventh day, there was recurrence of delirium, convulsions, and increase of right hemiplegia. The pulse was normal; there was a tendency to masturbation. There were no unusual appearances about the wound. The condition remained thus for several days, and then a slow improvement began. Fifty-one days after operation, several splinters of bone were removed. The patient became able to stand and walk, intelligence improved, but the hemiplegia remained unchanged, and the aphasia diminished slowly, so that after a lapse of several months he could only pronounce single words.

Remarks.—The advantages offered by the operation of trephining in the case I have above recorded were numerous.

In the first place, there was a certain degree of hope that there might be found a node springing from the inner table of the skull at a point corresponding to the one growing from the external table. But even in the probable event of not finding such a localized growth, it was most likely that there was diffused disease of the frontal bone and dura mater spreading from the base of the external node as a focus. It was thought, therefore, that it could not fail to be of advantage to remove so much of the source of irritation from the surface of the membrane. In addition to this, it was likely to be of benefit by diminishing, even if to a trifling extent, any pressure that might be caused by the thickening of the frontal bone and dura mater, as well as by allowing the discharge of any effusion that might have formed between the membrane and skull. A further object was to establish a process of healthy suppuration from the exposed surfaces of the dura mater, bone, and soft tissues around it, which might act as a derivative, and tend to prevent the spread and continuance of the inflammatory process in the surrounding bone and meninges.

Finally, it was evident that the rapid aggravation of the symptoms threatened a speedily fatal termination to the case, and that if time could be gained by the operation, a further opportunity would be afforded for pushing the use of antisyphilitic remedies, whose remarkable efficacy in the treatment of syphilitic cerebral lesions is so fully attested.

It may also be remarked, as a further point of evidence in favour of the operation, that in the only fatal case of the three reported by Mr. Henry Lee, the fatal result would seem to have resulted in great part from the fact that the external table of the skull remained entire after the inner one had been destroyed, thus giving an opportunity for the irritating pus to accumulate, to press upon the surface of the brain, and to induce inflammatory softening of its tissues. In estimating the results of the operation in the case I have reported, it seems to me impossible to avoid acknowledging that it was the chief means of saving the life of the patient. Examination of the portion of bone removed shows that it by no means embraced the entire extent of the disease; but its removal was followed by such rapid and positive amelioration of the symptoms present, as to convince all who saw the case that the operation exerted a most happy influence on the patient's condition. It may be thought that the operation might have been avoided had iodide of potassium been administered in doses much larger than were employed, viz., gr. x, four times daily. I confess that at the time this case was treated (1868), I was not so familiar as at present with the wonderful effects of very large doses (gr. xx, or xxx four times daily) of iodide of potassium in syphilis of the nervous system.

But, even with the encouraging experience of the past three years, I feel that W.'s condition was so desperate as to have, in all probability, resulted fatally, had not the operation of trephining been performed.

Dr. WILLIAM GOODELL remarked that this able paper of Dr. Pepper's reminded him of a case which came under his observation in Constantinople, but so many years ago that he was afraid he could not give the symptoms correctly, nor in the order of their sequence. An educated Armenian gentleman, with no known syphilitic taint, amiable, intelligent, and in easy circumstances, was attacked with severe hemicrania, limited, like clavus, to the middle of the right parietal bone. Without any relief whatever, quinia, blisters, setons, issues, mercury, iodide of potassium, frictions on the tongue and gums with the chloride of gold, etc., were prescribed, either by Dr. G. or by a large number of consulting physicians. He daily grew worse; became very irascible; began to stumble in his walk; aphasia soon gradually developed itself, finally dysphagia; and at last he became perfectly helpless, sitting on a sofa, with his head on a cushion, constantly moaning. From paralysis of the buccal muscles he was obliged to give up his pipe—considered in Turkey as a very fatal sign; but intelligence was not wanting, for he was capable of understanding, although not of articulating any but one or two guttural words. For a change of air he was removed to a village in the mountains, and, for several weeks, passed from Dr. G.'s observation. During this time an Italian surgeon, who had been roving over Turkey and Persia, cutting for stone and extracting cataracts, put up at this village, and succeeded in making a transient reputation by successfully opening a large psoas abscess, which no other physician would touch. He was accordingly called in, and, after vainly resorting to gamboge and other drastic cathartics, advised the trephine. The patient evidently understood this proposal, for he shook his head, and for several days kept repeating the word "Goo, Goo," sometimes shouting it at the top of his voice. In the Armenian language this word is a contraction for "come, come;" but when his wife and children gathered around him, in obedience to this supposed summons, he became very angry, and repeated the word with still greater energy. At last a quick-witted hunchbacked foster-brother suggested Dr. Goodell's name to him, when a loud outcry of assent, followed by a flood of tears, indicated that he had guessed right. A messenger was accordingly despatched for the doctor, who found the patient sufficiently conscious to evince great pleasure at his arrival, and to quietly submit to the operation, after it had been represented to him as his only chance. The Italian surgeon accordingly trephined the skull over the seat of pain, but there was not the thickening of the bone, nor the disease of the dura mater, which were anticipated. As this membrane pouted up through the opening, it was cut with a bistoury, when a considerable amount of limpid serum escaped. Almost immediately after the patient drew a long breath, and called out "Wife! bring some pipes"—or words to that effect—this being always the first act of courtesy to strangers. The family, who were in the next room, upon hearing these words—the first he had uttered for months—rushed in, and, after kissing the feet and still bloody hands of the physicians, embraced the patient in the most extravagant and affecting manner. The headache disappeared like magic, and, for two or three days, he was able to converse in an intelligible, although not in a grammatical manner. Strong hopes were entertained for his complete recovery, but, unfortunately, hernia cerebri set in and carried him off.

Dr. WILLIAM PEPPER, in illustration of the influence of trephining upon epileptiform convulsions, even when no local lesion is discoverable, referred to a case of epileptiform convulsions, and unconsciousness in the intervals, following a blow on the head with a heavy whip-handle, which was relieved by trephining in conjunction with venesection. In this instance there was no observable lesion either of the skull or dura mater. The lad recovered completely. (Dr. J. Forsyth Meigs, *Penn. Hosp. Rep.*, vol. ii., 1869, p. 181.) A similar case was under the care of Mr. A. Poland, in Guy's Hospital, about the same time. A boy had severe epileptiform convulsions and unconsciousness, following a severe blow on the head. He was trephined, and recovered perfectly. No local disease could be found. (*Med. Times and Gaz.*, Sept. 26, 1868.)

Dr. JOHN ASHHURST, Jr., referred to the well-known fact that epilepsy was frequently cured temporarily by modes of treatment which produced strong and sudden physical or mental impressions, and alluded to the former use of tracheotomy in this affection.

Dr. W. PEPPER said that the cases of which he had spoken differed in many respects from ordinary true epilepsy, the convulsions being evidently epileptiform in character.

Case of Anosmia.—Dr. HAMILTON related a case similar to one, the account of which had attracted his attention in the No. of this Journal for April, 1870, p. 537, of the loss of the sense of smell following a blow on the occiput. He was called, one morning, to a druggist, who, after closing his shop on the previous evening, had fallen backward while conversing with a friend. He was slightly stunned at the time, but soon revived. Pain, however, disturbed him during the night, and there was much swelling at the back of the head. A brisk purge was ordered, with cups and cold locally. After five or six days of suffering, from severe pain in the occipital and frontal regions, and intolerance of light, complete recovery took place, but the sense of smell was gone; and this condition persisted at the end of eighteen months. The cause of the fall was doubtful, and he was uncertain whether to refer the abolition of smell to it, or to the blow, or to some peculiar character and exceptional product of the ensuing inflammation. The patient had been healthy, and was not subject to fainting, but had been overtasked, mentally and physically, during several previous months.

July 6. Simple Acute Meningitis.—Dr. A. STILLÉ desired to call attention to some points in a case which was recently under his care in the Philadelphia Hospital, and which served to illustrate the general law that simple acute meningitis is never idiopathic. A man affected with chronic tubercular phthisis had been under observation for several weeks, and his pulmonary disease advanced slowly during this period, without presenting any peculiar features, and not even the local complications which are usual in that disease. One day he was suddenly seized with a chill, and, at the same time, with a severe pain in the head. Soon active delirium ensued, with such violence as to render the confinement of the patient necessary. He had fever, a hot head, and an excited expression. These symptoms were followed by coma and collapse, and death took place without having been preceded by paralysis of any part. On examination of the body after death, no tubercle, nor any granular condition of the cerebral membranes was found; but the meninges of the convexity of the brain were very much injected, and the pia mater of the same part was filled with pus and lymph. The corresponding cortical substance was also softened.

Sept. 7. Stöhrer's Zinc-carbon Battery.—Dr. WILLIAM PEPPER exhibited this instrument, which is for office use, and gave the following description of it:—

The instrument is made by Dr. Emil Stöhrer, of Dresden, and is, in every respect, highly satisfactory. The battery is composed of 32 zinc-carbon elements, hung by copper wires from a central bar, which crosses the top of the box containing the apparatus; they can be lifted off and replaced at will, so as to be cleansed or have new plates attached. The points of the copper wires enter small holes in the bottom of a groove in the central bar, and come in contact with a metallic conductor, by which the connection is made between adjoining elements. The cells containing the acid solution (1 pt. SO_3 to from 8 to 12 pts. of water) are arranged on a shelf, which is raised by handles moving through two vertical slits cut in each end of the box. The battery is put into operation by raising this shelf until the zinc-carbon elements are immersed, and then securing the drawer in this position by a simple contrivance. The number of cells from which the current is collected can be regulated at will, by sliding a little block bearing the poles, to which the electrodes are to be attached, along the groove in the central bar before mentioned. There are two copper clips projecting from the under surface of this block, which press against the copper wires attached to the elements, and thus establish the connection. There is also a commutator arranged on this block, by which the direction of current may be changed at will. It is, of course, a simple matter to produce interruption in the current, by introducing a telegraph key into the circuit.

The intensity of the current is capable of ample variations, and ranges from a feeble current from 1 or 2 elements, which might be passed through an induction coil and used for faradization, to one from 30, which will rapidly produce an eschar. It is, however, impossible to regulate the quantity of current, except by altering the amount of fluid in the cell, because the shelf which holds the cells can only be secured at one height. A very trifling addition removes this difficulty, and I have had two slips of metal attached to either end of the box parallel to the slit through which the handle moves, and having little projections at short intervals from each other, across which metal bars are placed, which thus enables the shelf to be retained at the height which will secure any requisite amount of immersion of the plates in the acid liquid. The current is extremely constant, and the entire apparatus requires no other attention than renewing the solution at long intervals. To prevent the amalgamation of the zinc plates from being impaired, a small amount of sulphate of mercury is thrown into each cell. The physiological effects obtained by the current derived from the battery are very striking, and I have already obtained gratifying success in several cases by its use as a therapeutic agent.

Oct. 19. A New Apparatus for Generating the Vapour of the Muriate of Ammonia.—Dr. HARRISON ALLEN exhibited an apparatus for this purpose, consisting of three flask-shaped vessels connected by India-rubber tubing, the first containing muriatic acid, the second liq. ammoniæ, the third, an intervening one, holding a small quantity of water. A current of air, created by the use of Richardson's apparatus, is made to pass through a "yoke," which enables both the acid and ammonia vapour to be received in nearly equal amount in the third flask, whence the vapour of the nascent muriate of ammonia is conveyed through tubing. The plan, it will be observed, the speaker remarked, is essentially the same as that figured by Tröltsch. The greater convenience of the instrument under notice is expressed in its compactness and portability; the entire apparatus, with accessory flasks to prevent regurgitation of the fluid along the tubing when the fumes are subjected to some pressure, is supported on a small walnut stand, and can be covered by a glass 6½ inches in diameter.

To Dr. W. H. Trueman is due the credit of thus making the apparatus elegant in appearance and suited for office use.

It is more particularly in the treatment of subacute catarrh of the mucous tract of ear that the fumes of muriate of ammonia are useful. In such class of cases the instrument can be placed alongside the patient and the fumes readily passed through the Eustachian catheter to the desired position.

Dec. 15. *On the Growth of the Nails as a Prognostic Indication in Cerebral Paralysis.*—Dr. S. WEIR MITCHELL read the following paper:—

During the last winter I saw Mrs. B., æt. 56, immediately after an attack of cerebral palsy. This lady had been previously in good health, and free from disease of the heart. In the evening, after dinner, while reading, she complained of headache, which increased during an hour, and was followed by sudden loss of power, complete in the left leg, and incomplete in the face and arm of the same side. There was no sensory loss, and the articulation was but slightly altered. The only remote prodrome was pain at times in the two limbs affected, but chiefly in the leg—a symptom which she ascribed to rheumatism, but which, whatever its cause, I have met with many times in persons afterwards afflicted with palsy on the same side. Without being confident of its value as a precursory sympton, I may state that in these patients there was often no rheumatic pain in the opposite side, or elsewhere. Mrs. B. had but little intellectual disturbance, and no loss of consciousness. She slowly recovered, so as to be able to walk quite well; but the arm, after improving for two weeks, again became weaker, and finally, after some months, grew gradually well enough to be used in knitting or in holding a book. The finger-nails on the left side, which were previously healthy and rather large, became marked with deep serrations, crossing from side to side, and about one line apart. This peculiarity remained so long as she was under my care, the growth being much slower than that of the nails of the healthy arm. I regret that I did not examine the feet.

Struck by these peculiarities, I did not fail to study the nail-growth in the next case of like nature. In May, 1870, I saw a gentleman, æt. 47, the night of an attack of severe apoplexy. He was a large, ruddy person, and he also had no heart disease, but had been subject to great strain, both mental and physical. He had for a week slight defect of memory, great weariness, and occasional vertigo, with a hissing sound in the right ear, which was worse after meals. The attack came on while he was pulling off a boot at night. He fell, slightly convulsed and unconscious, and when I saw him was able to lift the palsied hand with the other to direct my attention to it. His articulation was thick, his face strongly drawn to the left, and his tongue, when thrust out, deviated to the right side. The arm and leg were perfectly sensible, but he could stir neither of them. The leg recovered rapidly, and in a week he could walk a few steps, pushing a chair before him with the sound hand.

The morning after his attack, I stained four of the nails of the palsied right hand, down to the lower edge, with nitric acid, which tints these parts of a deep and quite lasting yellow, hoping thus to learn whether they would grow as fast as those of the other side. To my surprise, while the left healthy nails grew as usual, the right nails did not grow at all during three weeks. Then, and while the arm was throughout still motionless, the nails began to grow, as was shown by a narrow line of white below the tinted portions. Within a week after this the fingers became controllable by the will, and gradually the whole hand and then the arm was restored, so as to perform any except the most delicate tasks required of it.

Oct. 16, I attended Mr. C., æt. 46, who was suffering from great mental excitement concerning an election in which he was interested. His previous health was perfect. While lying in bed in the evening, somewhat drowsy from a small dose of morphia, he felt his right thumb drawn into the palm; then the forearm flexed strongly on the arm, while the right face twitched slightly, and in a few moments the right arm and leg became entirely paralyzed, as to motion only. There was no deviation of tongue or face, but he could not carry either eye fully to the right side. With these symptoms there was nearly complete aphasia, his only word being "yes." On the 17th he could make negative signs with his head, although still saying "yes" to every question. On the 18th he was able to say "yes," "no," and "certainly," and could repeat after me many simple words. Oct. 20. His right hand is slightly œdematous, and he now for the first time moves his toes. His vocabulary is enlarging, but he makes the usual curious blunders, and when trying to read aloud, frequently stops at long words and miscalls them; says he understands what he hears and reads.

The temperature of the right palm was at this time $95\frac{4}{5}$°, left $97\frac{2}{5}$° F. Ever since the attack he complained of pain in the right shoulder and of the occasional spasmodic flexion of the thumb and fingers. At this time, the fourth day, the hand being moveless, I stained the nails, except that of the little finger, on both hands. Not the slightest growth took place on the palsied side until November 2, when, seeing a line of white above the quick, I risked the prediction to his wife that within a week he would begin to move the limb. On the fourth day after, the thumb recovered some slight power, and the rest of the limb rapidly followed it, so that every muscle was under control on November 9, although for some time the extensors of the fingers moved with difficulty, because of the continued but lessening spasm of the flexors. The whole history of these cases I have not given, thinking it enough to relate so much of them as was sufficient for my present purpose.

Perhaps, also, I ought to excuse myself for reporting but two distinct cases, in place of waiting until numerous opportunities enabled me to be more sure of the constancy of the facts related. Cases of this kind, however, seen early, may not recur very often under my own eyes, and I shall probably increase the chance of studying this curious symptom by making it public.

Even now it suggests some reflections which I must be pardoned for intruding, because they will to some extent guide any future observer.

I have been unable to find that this observation has been made before. In old cerebral palsies the nails very often become deformed, and even the muscles may undergo changes which are possibly due to the neural sclerotic alterations which sometimes come on after the part has been long disused. They are then the direct result of isolation from spinal trophic influence. In recent cerebral palsies there is often œdema, but no muscular atrophy; and it is, therefore, remarkable that the nails should ever suffer in their nutrition. It is still more curious, when we reflect that even in parts whose nerves are severed, the nails grow as usual, and that chiefly in partial nerve-wounds do we meet with clubbing or serration.

It seems as if the injury to the brain must have exerted an inhibitory influence, and the fact aids, to my mind, the view which I hold with many, that there are nutritive nerves. Theorists who follow Brown-Séquard, would probably regard the checked growth as due to a spastic contraction of the vessels feeding the nail, and as a vaso-motor nerve impression.

I cannot admit this, because no conceivable amount of such spasm could last long enough or be complete enough to cause the result without making a visible difference in the tint of the nail and the thin parts at its matrix; and these remained much as usual, perhaps even a little redder than common. To test this view, I faradized with a secondary current and dry wire brush two of the nails daily, giving great pain and intensely flushing them. They were also kept thrice a day, for a half hour, in hot water, so as to flush them as much as possible. My patient, an intelligent person, being much interested in the question, submitted readily to this treatment, but no more growth took place in these nails than in the others. I have noted the lower temperature in the last case; but in hands cut off from all nerve connection, it is still slower, and yet the nails grow. It does look, therefore, in this case, as if some influence was at work here which did not act through a change in the vascular supplies. It is a point in favour of trophic nerves.

Other and most interesting questions also present themselves. The re-growth preceded the return of will power. If this should prove constant or common, it will certainly help us to answer the inevitable query as to whether the arm will recover at all, and how soon.

It is, of course, desirable to learn how often this check of nail-growth occurs—whether in all cerebral palsies or only in certain ones—whether, in a word, it relates itself to particular brain regions, and is a direct effect, or arises from the spinal shock which these brain injuries occasion.

I trust that I have been able to show, therefore, that this apparently trifling symptom may open the way to the solution of very important questions, and is certainly not devoid of interest for the most purely practical among us.

1871. *Jan.* 18. *Physiological Action of the Nitrite of Amyl.*—Dr. HORATIO C. WOOD called attention to this article, which had been used more particularly for the relief of angina pectoris. Certain cases have been reported of intense cardiac pain, in which chloroform caused only a temporary relief, but in which cases nitrite of amyl had produced an immediate and permanent effect. This substance, he said, had some very remarkable physiological properties which had tempted him to an investigation, which compelled him to form conclusions somewhat different from those of Dr. B. W. Richardson. Dr. Richardson says that the first prominent effect of this drug upon animals is a great excitation of the motor system. Dr. Wood did not find such to be the case. He had given it in a large number of cases to pigeons, cats, and dogs, and in the majority of instances it produced a state of gradually increasing paresis. Occasionally, however, the steady, onward course of weakening is interrupted by convulsions, especially in pigeons. One of the most marked and peculiar effects of the drug when taken into the system is the prevention of the change of venous into arterial blood. The blood in all the vessels very soon becomes of the same, or nearly the same hue, and he had found that this was not owing to any action on the nervous system, for it is impossible to oxidize, or at least to produce the change of colour commonly attributed to oxidation, in venous blood which has been drawn from the body, and had a portion of the amyl salt added to it.

He had investigated its action upon the nervous system very carefully, and found that it does not destroy the conducting power of the nerve-trunks, although it impairs that power. He had poisoned a frog with nitrite of amyl and exposed the crural nerves, and found that the nerves responded to strong stimuli, which caused motion in the lower muscles of the leg, but he always failed in such cases to produce reflex action. Feeble stimulation failed to elicit muscular contraction, and while the power of the muscle to contract is impaired, it is never destroyed except where the nitrite of amyl is applied locally. So far from being a powerful cardiac stimulant, it is in animals a direct depressor to the circulation. It increases the number of heart-beats, but it never increases the force of its action. The force of the individual heart-beats is not much affected early in the action of this drug. There are several reasons for supposing that it causes dilatation of the capillaries. There is produced, when it is first taken into the animal in any way, lessened arterial pressure, probably by such dilatation, and by and by the heart itself begins to slacken in power. When this substance is applied to muscles of organic life it appears to act precisely as it does on the voluntary muscles. One of the most curious effects the speaker knew of is its local action. It is not an irritant, and yet when kept long in contact with a tissue it produces death of that tissue, and this applies equally to muscular and nervous tissues. In the majority of cases, when it is simply thrown hypodermically into the muscles there is but little effect, but if kept long in contact with the muscle it produces complete death, local putrefaction following.

In the case of this drug, we appear to be on the very verge of settling how at least one medicinal agent acts upon the tissues of the body. This drug has the curious chemical property of checking oxidation. He had placed a piece of phosphorus in a jar, put the jar in water raised to 112° Fah., taken it into a dark room, and the phosphorus was seen to glow most vividly. He then put five drops of nitrite of amyl into the bottle, and instantly the phosphorus was extinguished. Here oxidation is evidently arrested, and there is apparently, as already stated, a similar action on the blood in the body. It would seem, then, that nitrite of amyl acts on the system by checking the chemical changes which are necessary to the exercise of any function whatever. If this be so, we we may anticipate its influence on the animal temperature, and on the elimination of carbonic acid gas. It lowers the animal temperature to a degree which is almost unheard of in the history of drugs. He had witnessed a fall of 12 degrees in the temperature of an animal which had been given nitrite of amyl, and yet death was not produced. The animal seemed perhaps a little giddy, but otherwise just as before taking the drug. He had not as yet had time to take the next step, to discover whether it arrests the elimination of carbonic acid. If this experiment should prove what he supposed it would, it would furnish almost absolute proof that the nitrite of amyl does prevent tissue change. Then every man can draw his own inference as to whether this is the actual cause of its action on the body.

These investigations strike a heavy blow at certain theories in regard to the cause of the action of anæsthetics. It has been asserted that the cause of anæsthesia was the fact that the drug prevented oxidation. Now, here we have a drug which appears to and does prevent oxidation, and yet the very last tissue to be affected is the brain-tissue, the animal preserving its consciousness to the very end. Consciousness and sensibility are two of the last functions which are annihilated by the nitrite of amyl.

Large Stone removed from Female Bladder.—Dr. W. F. ATLEE presented a stone removed by rapid dilatation of the urethra, from the bladder of a woman.

The stone is a hard one, $3\frac{1}{10}$ inches in its greatest circumference, and $2\frac{9}{10}$ inches in its smallest; its weight is 220 grains. The patient was seventy-three years of age, and submitted to the operation on account of the violence of the pain, which was almost incessant. To dilate the urethra, the patient was rendered insensible by the inhalation of chloroform, and Holt's dilator for the sudden cure of stricture was used. Afterwards an ordinary dressing forceps was passed and withdrawn more and more opened, some half a dozen times. There was some hemorrhage for a day or two after the operation, and, of course, considerable soreness was felt for some five or six days. There was, however, never at any time any difficulty in retaining the urine in the bladder. The operation was performed last August, more than four months ago.

Complete Excision of the Astragalus and Os Calcis.—Dr. T. G. MORTON presented a case of excision of these bones, with the following notes:—

D. C., aged 13, was admitted into the Pennsylvania Hospital Sept. 27, 1869.

He had received an injury of his left heel in January, 1868, an abscess quickly formed, and the foot was much swollen. The pus found an exit after several weeks, and sinus after sinus formed, accompanied by severe pain. At the time of his admission, four of these fistulous tracks existed, all communicating with the os calcis; and when probed, it was found that a considerable extent of the cancellated structure of this bone was involved.

The usual operation was performed Oct. 2, 1869. The os calcis and astragalus were alike involved, and both were removed, no arteries required ligation; and the limb and foot were placed in a pasteboard splint. A very perfect recovery followed, both as regards motion in the new joint, and in the usefulness of the foot, which was shortened about one inch.